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quantity of the same substance, in the most powerful furnaces; and with this advantage, that the process is always under the inspection of the operator; whereas he can only conjecture what passes in the centre of a furnace.

In using the blow-pipe for experiment, a piece of charcoal is generally used to support the subject, and held in the flame of the lamp; the charcoal should be of a close compact grain, and properly burnt; for if it is too little carbonised it will flame like a piece of wood, and obscure the object; and if it is too much burnt, it is so quickly consumed and burnt to ashes, that the object is in danger of being lost in it; the charcoal greatly increases the heat by reverberating the flame, and by heating the object at the opposite side; itself being converted into fuel, and excited by the blast, and thus creates an atmosphere of flame and heated air around it, which prevents the heat being carried off so fast, or the object being so much cooled, as if it should for an instant be moved out of the cone of the flame, from the unsteadiness of the hand, or from accidental currents of air, which would disturb the flame, and cause such a wavering in the point of the cone as to divert it in some measure from the object. In order to prevent more tallow than is necessary from being consumed, to produce the intended effect, it is convenient to have several lamps, with wicks of different thicknesses, viz. one to hold two flat cottons, (such as are used for the Liverpool lamps,) of about one inch and a quarter broad, another to hold four, and a third to hold six, or as much common wick yarn as is equal to those wicks in bulk; glass jets should also be provided of different sized apertures, to suit the greater or lesser sized wicks and flames, and deliver streams of air upon them proportionately, and their jets should point upwards in a small degree: hogslard is also equal, or perhaps superior to tallow for the lamp.

On a new Method of planting Asparagus. By Mr. James Smyth, Gardener to the Earl of Kintore, at Keith-Hall, Aberdeenshire.

[From the Transactions of the Caledonian Horticultural Society.]

In April, 1807, I sowed some drills of asparagus seeds, which succeeded very well. I had intended to let the plants stand two years in the seed-rows; but in the third

week in June, 1808, in preparing a piece of ground for a late crop of peas, it occurred, (owing to my having been often unsuccessful in the planting of asparagus in spring,) to try a drill of it at this uncommon season. At one side of this piece of ground, therefore, I prepared a small stripe, with plenty of rotten dung, which was dug in to the depth of eighteen inches, and carefully mixed to the surface. In a drill, four or five inches deep, I planted my asparagus, at that time twelve or fifteen inches high, at three inches apart; keeping the tops perfectly upright, and breaking or hurting the roots as little as possible. They were covered in with the spade, gently trod with the foot, and a good watering finished the operation.

Although no particular care was taken to keep the earth about the roots of the plants at the time of taking them up, I hardly perceived them to flag, or sit up in their growth a single day. I am certain that none of them died; and they surpassed, in the course of the summer, the plants that were left in the seed-rows.

The following winter I put the whole piece of ground in preparation for the remainder of the seedlings, and about the end of March I planted them in drills four feet asunder, and three inches in the drill; but although due attention was paid to them in every respect, not one-half of them came forward; while those that were planted the preceding June were making such progress that I could have cut some of them for use.

The piece of ground consists of a thin gravelly soil, with a large proportion of peat-moss in it, (perhaps two-thirds,) having been the foundation of an old peat-stack.

Note by Mr. Nicol, Secretary to the Society.

I can vouch for the correctness of this communication, having seen the asparagus in question. I wrote Mr. Smyth in December last, requesting a statement of the matter, in the shape of a communication to the Society. W. N.

Leith-Walk, 2nd March, 1810.

On Gooseberry Caterpillars, and Maggots that infect Onions. By Mr. John Macmurray, Nurseryman.

[From the Transactions of the Caledonian Horticultural Society.]

Observing that the Caledonian Horticultural Society has requested information

respecting "the best method of preventing or destroying the caterpillar on gooseberries." I beg leave to submit some observations on the former of these subjects; for prevention is certainly better than cure. I may premise, that my observations are founded on actual experience.

I shall first mention a preventive of a very simple kind, but which I have found efficacious.

In autumn, let a quantity of *cow-urine* be provided; and let a little be poured around the stem of each bush, as much as suffices merely to moisten the ground. This simple expedient has succeeded to admiration; and its prophylactic virtues have seemed to extend to two successive years. The bushes which were treated in this manner remained free of caterpillars; while those that were neglected, or intentionally passed over, in the same compartments, were totally destroyed by the depredations of the insects.

I have next to state another mode of prevention, equally simple, and equally efficacious; but the salutary effects of which extend only to the season immediately following the application.

Collect as much drift *sea-weed* from the beach, when opportunity occurs, as will cover the gooseberry compartment to the depth of four or five inches. Lay it on in autumn. Let this covering remain untouched during the winter and early spring months. As the season advances dig it in. This plan has answered my most sanguine expectations; no caterpillars ever infesting the compartments treated with *sea-weed*.

The *rationale* of the operation of these substances, when applied to the soil around the roots of gooseberry-bushes, I leave to speculative inquirers.

I am rather uncertain as to the particular species of caterpillar which commits the greatest ravages on the gooseberry-bush. Two species very generally occur; the Linnean names of the moths produced from which, are, *Phalena Waqaria*, and *Ph. Grassulariata*. My own experience would lead me to conclude, that the first of these species is the most common and the most destructive.

Though it would appear, from the observations of naturalists, that not a few lepidopterous insects pass the chilly months of winter in the pupa state; yet an equal number lie concealed in the egg, which has been carefully deposited by the parent insect, where the genial influence of

the sun will early call the caterpillar into action. A number of caterpillars, however, also retire into the earth, and remain there, in the pupa state, until the return of spring excites to new changes and exertions.

What has now been stated seems to render it probable, that the beneficial effects derived from covering the gooseberry compartment with *sea-weed*, may depend on the strong effluvia arising from the putrefactive fermentation of the *sea-weed*, proving destructive to the ova of the moth which may remain imbedded in any crevices of the bark near the root; or on the saline properties of that substance sinking into the earth, and hindering the fertility of the ova deposited there.

I observe, that information is also wanted concerning the *Maggot in Onions*. This animal may, in my opinion, be considered as a non-descript, and peculiar to the onion and shallot. The *Allium Cepa*, or onion, is a native of Spain. It is natural to expect, that the soil and climate of this country should not be very congenial to this plant; and it follows, that the value and quality of our crops of onions must always, in a great measure, depend on favourable seasons, and the selection of a suitable soil.

If the season be dry and parching, and the soil of itself incapable of supplying the fibres with a proper and equal degree of nourishment, the plant becomes languid, assumes a sickly hue, and generally dies.

When, on the other hand, the season is very rainy, I am inclined to believe that the fibres get clogged with moisture, and the vegetable not being able to absorb it, it centres about the bulb; mouldiness succeeds to damp, and produces an ulceration which works its way to the inner core. This, of course, effectually destroys the onion.

I have always remarked, that whenever the onion becomes diseased it is liable to the attack of the maggot.

I could never detect this maggot in the soil: it is, therefore, highly probable, that the eggs are deposited in the root, and may be hatched in greatest numbers when the plant is in a sickly state. I do not think that the maggot ever passes from one onion to another. And any remedy sufficiently powerful to destroy the insect must inevitably destroy the onion itself.

In these circumstances the horticulturist

perhaps does all that is in his power, if he be duly careful to select for his crop of onions those soils and situations that are most likely to resist the various common incidents of season, peculiar to this very variable climate, and containing such eligible food, and in such proportions, as this bulbous esculent requires.

The maggot which attacks the carrot, I may remark, is certainly to be found in the soil, and visibly enters from without.

I conclude, for the present, with observing that worms and insects in general are driven from their retreats under ground by pouring bitter or acrid water upon it; such as water in which green walnuts have been steeped, or a ley made from potashes.

On destroying the Caterpillars infesting Fruit Trees. By Mr. Edward Sang, Nurseryman.

[From the Transactions of the Caledonian Horticultural Society.]

For the first seven years after the planting of my fruit trees on Loanywells garden-walls, they made a most promising progress. But after this period they became by degrees overrun with caterpillars, chiefly, I believe, of *phalana asperana*, which regularly made their appearance at the time of leafing.

The leaves were rolled up, and cemented with a glutinous substance; the caterpillar was lodged in the heart of the leaf, rolled up in a kind of imperfect cobweb, something like spider's work; and in this manner committed wonderful depredations.

Many of the buds never expanded, especially the fruit-buds, which having produced the foot-stalk of the young apple, the corolla never opened: it held the larva within it, which generally ate a hole down through the heart of the expected fruit, and so completed its destruction.

Year after year, even so late as the first or second week of June, many of my wall trees exhibited an appearance more like January than midsummer. After the depredations of the caterpillars were over, and when these had entered the chrysalis state, the trees made vigorous efforts to supply what had been destroyed, and generally produced a great profusion of breast-wood. The circumstance arose in some measure from the moths, as they came out, choosing in preference to deposit

their eggs in the flower-buds.

In spring, 1805, I had recourse to fresh water, which I threw upon the trees with as much violence as a hand force-pump was capable of; but from the worm being rolled up in the blossoms it was defended from moisture, which otherwise seems destructive to it, I did little or no good by this application.

In spring, 1806, I attempted their destruction by soot. After having wetted the trees, by means of a force-pump, I applied the soot with a bellows, containing it in a hopper attached to the pipe, with proper holes in the upper part. By this instrument I had the soot properly applied; and I flattered myself that I now had hit upon the means of destroying the caterpillar completely; but I found myself again disappointed.

After a great deal of trouble, and much expense, my trees still wore a sickly appearance, excepting that the breast-wood was always abundant. I now found my difficulties increased, my trees rendered unfruitful, and yet producing a profusion of fore-right shoots.

I had formerly experienced the good effects of cutting the roots of fruit-trees, which were too luxuriant in their growth, and had one of the trees laid open for this operation in the season 1807-8. The roots were large, but with few fibres: I found it necessary to shorten them, not only to stop the rambling growth complained of above, but to furnish the tree with proper feeders, in order to render it fruitful, in case of getting the better of the caterpillar. In this operation I observed, upon examination, that the soil was deficient of a proper quantity of animal substance. I consequently set about making up this deficiency.

In 1807 and 1808 fodder was very scarce, and many old horses killed. I availed myself of this circumstance, and collected all the dead horses I could procure in the neighbourhood, and I soon found myself master of above twenty carcasses. I had the trees on my East and South aspects, treated as follows: A circular trench was made, about three feet distant from the trunk, and so deep as to cut every root through: into this trench was put half a horse at least, divided into proper pieces, and covered up. The following spring, however, the caterpillars were not in the least diminished.

In spring, 1809, I resorted to tobacco-